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(54) Method and apparatus for annotation of medical imagery to facilitate patient identification, diagnosis and treatment

(57) A method and apparatus for annotation of medical imagery to facilitate patient identification, diagnosis, and treatment is characterized by an imaging device for producing a first signal representative of sensed characteristics of the individual and a minutiae generator which receives the first signal and produces a second signal representative of minutiae of the individual. the minutiae corresponding to specific branch points of blood vessels of the individual. A minutiae data generator analyzes the characteristics of minutiae and produces a third signal representative of the characteristics which is stored in a minutiae database for each of the plurality of known individuals and their medical conditions. The minutiae and minutiae data may be used to annotate medical imagery to facilitate subsequent image comparison by providing standardized registration points and time-varying characteristics. A minutiae matcher pairs corresponding second signals and third signals from a current patient with those from a database record, and the paired signals are used to align the images and compare them. The minutiae analysis techniques of the invention can be used to identify medical patients, assist in the diagnosis of medical conditions, and detect and monitor the use of alcohol and drugs, including anesthesia.

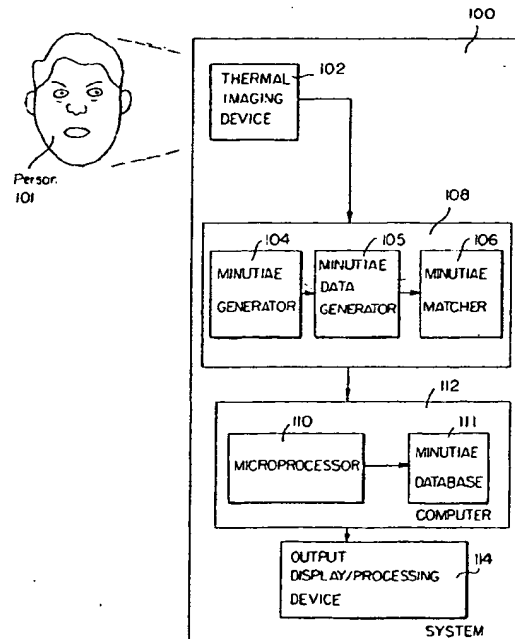


FIG. 1

EP 0 867 830 A3



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EUROPEAN SEARCH REPORT

Application Number
EP 98 30 2267

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.CI.6)
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Y	* column 3, line 39 - column 4, line 33; figure 13 *	5,8,10	
Y,D	US 5 163 094 A (PROKOSKI FRANCINE J ET AL) 10 November 1992 (1992-11-10) * abstract *	5,8	
Y	CROSS J M ET AL: "THERMOGRAPHIC IMAGING OF THE SUBCUTANEOUS VESICULAR NETWORK OF THE BACK OF THE HAND FOR BIOMETRIC IDENTIFICATION" PROCEEDINGS OF THE 29TH. ANNUAL INTERNATIONAL CARNAHAN CONFERENCE ON SECURITY TECHNOLOGY, SANDERSTEAD, GB, OCT. 18 - 20, 1995, no. CONF. 29, 18 October 1995 (1995-10-18), pages 20-35, XP000585833 SANSON L D (ED) ISBN: 0-7803-2628-8 * page 28, left-hand column, line 1 - line 26; figure 14 *	10	
X	PROKOSKI F J ET AL: "IDENTIFICATION OF INDIVIDUALS BY MEANS OF FACIAL THERMOGRAPHY" PROCEEDINGS OF THE INTERNATIONAL CARNAHAN CONFERENCE ON SECURITY TECHNOLOGY: CRIME COUNTERMEASURES,US,NEW YORK, IEEE, page 120-125 XP000357473 * page 125, left-hand column, paragraph 2; figure 4 *	13-26	TECHNICAL FIELDS SEARCHED (Int.CI.6) A61B G06K G07C
A	US 5 515 847 A (BRAIG JAMES R ET AL) 14 May 1996 (1996-05-14) * abstract *	13-26	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 23 December 1999	Examiner Sonlus, M
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03/02 (P4/C01)



European Patent
Office

Application Number

EP 98 30 2267

CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

- ☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):
- ☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet 8

- ☒ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- ☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.
- ☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:
- ☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:



European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 98 30 2267

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	US 5 608 210 A (ESPARZA JOEL ET AL) 4 March 1997 (1997-03-04) * abstract *	27-33	
A	US 5 186 174 A (MOESGES RALPH ET AL) 16 February 1993 (1993-02-16) * abstract *	27-33	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
Place of search		Date of completion of the search	Examiner
THE HAGUE		23 December 1999	Sonius, M
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons</p> <p>& : member of the same patent family, corresponding document</p>			

EPO FORM 1533 C3 82 (P04C01)



European Patent
Office

**LACK OF UNITY OF INVENTION
SHEET B**

Application Number
EP 98 30 2267

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. Claims: 1-12

Classification or identification of persons based on
features relating to bloodvessel patterns

2. Claims: 13-26

Diagnosing a condition of a person or persons based on
bloodvessel patterns

3. Claims: 27-33

Using particular parts of a bloodvessel pattern as
positional reference points

ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

EP 98 30 2267

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

23-12-1999

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82